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"Prospective Comparative Study of Middle Ear Pressure Changes before and After Septal Correction in Patients with Deviated Nasal Septum"

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I. INTRODUCTION

Nasal obstruction due to septal deviation is one of the common ENT complaints. It can affect hearing and middle ear ventilation by altering the Eustachian Tube (ET) function.ET dysfunction can occur due to obstruction of ET orifice in patients with Deviated Nasal Septum (DNS) due to nasal inflammation and increased secretion from nasal glands which accumulate and block the tube.This can lead to reduced middle ear ventilation leading to negative middle ear pressure and can impact hearing. This leads to fullness of ears, ear ache & tinnitus.So, the question arises that can treatment for DNS improve patient's hearing by improving ET function and middle ear ventilation?So, we had taken up this study to assess the improvement in patient's hearing and middle ear function by means of PTA and Tympanometry and improvement in patient's ear complaints after septal correction.

II. MATERIALS AND METHODS

This study was conducted in Department of ENT of our Medical College and Hospital from June 2023 to May 2024 and patients were followed up till 12 weeks(2nd post op day, 4th week , 8th week,12th week). 60 patients aged between 15 to 65 years with Deviated Nasal Septum requiring Septal correction surgery were included in this study after taking written consent from the patients. The approval of the Institutional Ethics Committee was taken.60 patients included in this study underwent detailed history taking, nasal and ear examination, Diagnostic Nasal Endoscopy (DNE), Examination under microscope. Patients preoperatively were evaluated for otological symptoms like fullness of ears, pain in ears and tinnitus. All these patients underwent pure tone audiometry (PTA) for hearing assessment and tympanometry for assessment of middle ear function. These patients then underwent Septoplasty under General Anaesthesia and anterior nasal pack was placed for 2days post operatively. Patients were again assessed after 2days (after pack removal) and the assessment was repeated 4weeks, 8weeks and 12weeks post operatively.The assessment points were

- Otological symptoms of fullness of ears, pain in ears and tinnitus at each post-operative evaluation. Evaluated by history taking,
- Middle ear function at each post-operative evaluation. Evaluated by tympanometry,
- Hearing assessment at each post-operative evaluation. Evaluated by Pure tone audiometry.

III. RESULTS

60 patients between age group 15 to 65 years were included in this study. The majority of the patients were of younger age group. There was no major difference between males and femalesThe majority of patients (92%) at initial visit had symptoms of fullness of ears. In 28% of patient ears at initial visit the findings of conductive hearing loss were obtained on pure tone audiometry. In 36% of patient ears Type C tympanogram was obtained on tympanometry. Post operatively there was increase in symptoms of ear fullness, ear ache and tinnitus at initial post-operative evaluation after 2 days of surgery. There was marked improvement in ear fullness at 8 weeks post operatively and even more at 12weeks post operatively. Not much improvement was achieved for earache and tinnitus though it recovered later as compared to 1st assessment 2days after surgeryRegarding PTA findings there was initial worsening of hearing loss at 2days post operatively with more number of patient ears suffering from conductive hearing loss. There was improvement thereafter with marked improvement at the end of 12weeks post operatively with only 9% of patient ears suffering from conductive hearing loss. The conductive hearing loss obtained was of mild to moderate type with hearing threshold between 25 to 55 decibel. Only 6% of patient ears had sensorineural hearing loss (SNHL) with no worsening or improvement post operatively.Normal hearing was defined on PTA as average pure tone threshold within 25 decibels. Conductive hearing loss was stated if air bone gap on audiogram is greater than 15 decibels. SNHL was stated if bone threshold was greater than 20 decibels. Regarding tympanometry findings, Type C tympanogram

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indicative of negative middle ear pressure was obtained in 36% of patient ears at preoperative visit which worsened to 44% of patient ears at 2days post operatively and thereby improved significantly with only 12% of patient ears had type C tympanogram at end of 12weeks post operatively.

IV. CONCLUSION

As a conclusion in our study we found improvement in ear fullness, decrease in incidence of conductive hearing loss and improvement in middle ear pressure after 8- 12weeks post operatively. Not much improvement was seen before 8weeks which shows that septoplasty improves hearing and middle ear function after 8-12weeks of surgery which could be because inflammation and oedema of nasal mucosa due to surgery takes time to heal. If we refer to literature, we found similar results by Maier W et al who showed normalization of tubal function 6-8weeks after surgery whereas Kamal NP et al got favourable results after 4weeks of nasal obstruction surgery contrary to our findings.